Flood Mitigation and Adaptation Strategies for Small - Scale Fisheries and Aquaculture in Nigeria

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Introduction

A focal point of the United Nations is to combat climate change effects across the globe and conserve the sustainable use of oceans, seas and marine resources for sustainable development. Climate change has been identified as one of the major global problems threatening the survival of the human and non-human alike (Onu and Ikehi, 2016), which in turn hinders sustainable livelihoods and economic development, especially in developing countries (Shemsanga *et al*., 2010). In Nigeria, there has been escalating effects of climate change in the form of flooding and drought, wreaking havoc to lives, property, and agricultural enterprises, especially in fisheries and aquaculture. In 2012, Nigeria experienced a double shock of severe drought in the North East and widespread flooding that affected most of the rest of the country (GFDRR, 2019). The flood disaster was categorised as the worst ever in 50 years, affecting 7 million people, causing 2.6 trillion Naira worth estimated damages and losses in 30 out of the 36 states (NEMA, 2015; Chioma, *et al*.2019).

Despite the fisheries and aquaculture sub-sectors contributing 5% of Gross Domestic Product (GDP), and adding values to the economy in terms of food and nutrition security, employment creation, livelihood sustenance, etc., (Vanguard,2013), there is still lack of national attention to the subsectors in terms of national policy and strategic planning on climate change which currently threatens the potentials of these subsectors. Historically, some areas of land are prone to flooding in Nigeria. These include lowland, coastal and areas along major rivers and tributaries, and flood plains (Adekola, 2018,

Adelekan, 2010). Disasters tend to hit the poorest and most marginalised demographics the hardest. Women and girls are particularly exposed to climate-related disaster -they suffer higher rates of mortality, morbidity, and economic damage to their livelihoods (NEMA, 2018). Women and children have structural, lifecycle and community vulnerability during periods of disasters. (Adegoke *et al.*, (2015).

Nigeria has recorded improvement in preparedness to mitigate the impacts of shocks and stress resulting from climate change and natural disasters. Practitioners are better informed and educated than in 2012 and have developed better coping skills and strategies. However, since 2012, the devastating effects of flooding on fisheries and aquaculture have included loss of infrastructures, high fish mortalities, loss of livelihood and investments in areas prone to flooding. The subsequent actions and inactions generated the interest in evaluating the roles of government and development of flooding mitigation and adaptation strategies in Nigeria. This forms the fulcrum of the study. Specific objectives are:

1. Document activities at different levels of government since 2012.
2. Evaluate status of preparedness to mitigate the impact of shock and stresses.
3. Identify limiting factors to mitigation and adaptation efforts and to reducing flood vulnerability.
4. Proffer ways to reducing vulnerabilities to flooding.

Methodology

The study was carried over a period of six months. Methodology was based on a mixed approach of use of questionnaire and semi-structured interviews conducted via telephone calls and emails. Key respondents were fishermen and fish farmers, randomly selected from across the country, based on their experiences with flooding, their areas of operations, years of experience and national leadership positions in small - scale fisheries and aquaculture. The States for the study were purposively selected based on frequency, or magnitude of flooding. The general opinion and information obtained were used to complement findings.

Results

Results revealed that flooding was attributed to many factors which are interconnected: global environment change, deforestation, opening of dams, poor drainage system, blockages of waterways,

etc. The study found that the small-scale fishers were the most hit in terms of loss of fishing investments such as gears, fishponds, fish seeds, fish feeds and the like. To mitigate such losses in the future, as a result of flooding, the fishermen and fish farmers have put in place some measures which are structural and operational strategies. Structural strategies put in place include provision of flood early warning system, construction of good drainage systems and dykes, provision of good boats and pond netting, suitable sites for farming, and dredging of riverbanks, among others. The operational strategies include evacuation of stocks from flood prone areas during rainfall peak periods, educating fish farmers on proper siting of farms through extension services, trainings on adaptation measures, seasonal farming, etc. In times of flooding, fishermen and fish farmers relocated to temporary Internally Displaced People camps to ensure safety of their lives, equipment and livelihoods. To adapt to the situation, fishers practice seasonal farming and re-enforcing the dykes and netting of ponds.

There has been slow, but steady response at different levels of governance in Nigeria. In 2012, FGN and FAO under the Central Emergency Relief Fund (CERF) project, distributed inputs (fingerlings, fish feeds, fishmeal, smoking kilns), to fish farmers and processors, in the eight most ravaged states (FDF, 2013). The FGN Growth Enhancement Support Scheme (GESS), also distributed fishing inputs to fishermen in the states highly impacted by flood**.** However, there had been no further specific financial budgetary allocation, funding or input supply to the sub-sectors by the FGN since 2013. Similarly, there has been no recorded activity, in implementing the National Agricultural Resilience Framework (NARF) led by the Advisory Committee on Agricultural Resilience in Nigeria (ACARN).

Support to fishermen and fish farmers varies by state. In terms of response, Lagos State is reported to have the best response to flooding emergencies. Ogun State provided workshops on insurance awareness. Delta state supported in cash and kind to cooperative fish farmers and dredged some inland rivers. Jigawa State gave nets and fingerlings while others (Yobe and Adamawa), are building channels to control water flow.

Limiting factors to better impacts at mitigating flooding in the sub-sectors include lack of governments' definite policies, funding, comprehensive data, sector-defined emergencies, or response processes, reporting system or capacities and capability of government to cope with the magnitude of the effects of flooding or drought in the country. However, efforts must be geared to place fisheries and aquaculture on high priorities in all developmental and humanitarian programmes in the country, with a female-centric approach.

Conclusion

Efforts over time, at mitigating climate change effects, on Fisheries and Aquaculture, have been more reactionary than proactive. Among the small-scale fish farmers, women fish farmers are the most vulnerable and hence, efforts must be geared towards supporting the women. To forestall further damages/losses by flooding, the small-scale fish farmers now put in place structural and operational strategies to mitigate flooding.

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